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10 - 310/03  
26 December 1963  
Copy 3

MEMORANDUM FOR: Chief, Manufacturing and Services Division, ORR

ATTENTION :

THROUGH :

FROM :

SUBJECT :

REFERENCES :

- (1) ORR Requirement No. C-RR3-80,642  
(2) CIA/PID Project No. C 1377-63

1. This memorandum is in response to the referenced requirement which asks for a detailed analysis and annotated photo enlargement of the Ust'-Kamenogorsk Titanium-Magnesium Combine.

2. Of the referenced [ ] Missions the subject plant was observed only on [ ]

[ ] this plant was in the very early stages of construction. The plant was in a late stage of construction with portions of the plant in operation as of [ ]

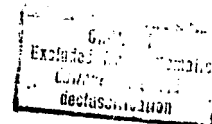
3. The Ust'-Kamenogorsk Titanium-Magnesium Combine is located 7.2 nautical miles northeast of Ust'-Kamenogorsk, USSR, at 50 02N - 082 45E. The plant is both rail and road served. A fence could be observed only part way around the installation; however, it undoubtedly is completely secured.

Although the name of this installation indicates that both titanium and magnesium are being produced, it is the opinion of the analysts, that only titanium is being produced as an end product. If magnesium is the reducing agent, the plant would certainly contain electrolytic cells for refining pure magnesium. However, the magnesium would be continually recycled in the process.

Complete analysis of the plant is not possible from [ ] photography (see enclosure CIA/PID/IB-P-795/63); however, essential components can be identified which will be useful in estimating the capacity of the plant.

Declass Review by NGA.

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**SUBJECT: Ust'-Kamenogorsk Titanium-Magnesium Combine**

In producing titanium metal the titanium ore must first be processed to eliminate impurities and leave a relatively pure titanium oxide. The incoming ore is treated in the ore processing section (see annotated enclosure) where at least some of the concentration or purification takes place. The exact identification of facilities in this section cannot be determined. The next step in the production that can be identified is chlorination which takes place in the tall chlorination building (annotation 2) which measures 535 by 100 feet.

Titanium tetrachloride, from the chlorination building goes to the long, narrow reactor building (annotation 8) which measures 1080 by 75 feet. It is impossible to determine from photo interpretation whether magnesium or sodium is used as a reducing agent in the retorts housed in the reactor building. A probable second reactor building is under construction, parallel to the existing one (annotation 7). As of  the roofed portion of this building measures 465 by 80 feet with exterior walls extending 190 additional feet.

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The titanium sponge (spalt) from the reactors is next purified to remove either magnesium chloride or sodium chloride depending on the reducing agent used. The purification building could not positively be identified; however, building annotated 12 is identified as the probable purification building. The building where final melting and casting of titanium metal is done could not be identified.

There are a number of unidentified buildings at this plant. At least one of these will contain electrolytic cells for the regeneration of pure magnesium or sodium which in turn is recycled to retorts to reduce titanium tetrachloride. Other buildings may house equipment for further processing of incoming ore prior to chlorination and equipment for the fabrication of titanium products.

A thermal electric power plant (annotation 3), within the plant area, supplies the large power demands of this industry. The source of cooling water for the power plant was not discernible; however, a probable discharge channel (annotation 5) extends from outside the secured area to the Ul'ba River. The exact function and association of the two large and one small basins (annotation 6) near the river could not be determined.

4. No estimate of production capacity can be made from photo evidence alone. The overall plant appears to be active; the power plant is in operation, a slight trace of fumes were being emitted from the stack associated with the chlorinator building, and two piles of light-toned raw material were present (annotation 13). Total roof cover, not including the two groups of administration buildings, is 920,850 square feet.

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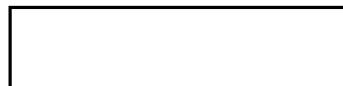
SUBJECT: Ust'-Kamenogorsk Titanium-Magnesium Combine

5. From evidence observed on photography of [ ] further expansion of facilities are planned. The area to the west of the completed reactor building has been filled and leveled since 1957. Two buildings are in an early stage of construction in this area (annotation 10). Total roof cover of the buildings under construction when completed will be 104,050 square feet. 25X1

6. The photo analysts assigned to this project were [ ] who may be contacted on extension [ ] should you have further questions concerning this project. This memorandum will be followed by a formal report. 25X1

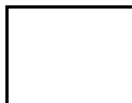
## ENCLOSURES:

1 Annotated Photo Enlargement  
(CIA/PID/IB-P-795/63)



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